

CLAIMS

What is Claimed:

1. A method for filling of a plurality of syringe bodies, wherein for each syringe body the method comprises:

5 holding the syringe body in at least one holder;
removing a cap from a dispensing end of the syringe body during said holding step;
filling the syringe body at the dispensing end thereof during said holding step;
and,
10 replacing said cap on the dispensing end of the syringe body during said holding step.

2. A method as recited in Claim 1, wherein for each syringe body the method further comprises:

15 placing said cap on said dispensing end of the syringe body prior to said holding step.

3. A method as recited in Claim 2, wherein for each syringe body the method further comprises:

20 sterilizing the syringe body after said placing step and prior to said holding step.

4. A method as recited in Claim 3, wherein said placing and sterilizing steps are completed at a first location and said holding, removing, filling and replacing steps are completed at a second location remote from said first location.

25 5. A method as recited in Claim 4, wherein for each syringe body the method further comprises:

packaging said syringe body in a container at said first location after said placing step and prior said holding step; and,

unpackaging said syringe body from said container at said second location prior to said holding step.

6. A method as recited in Claim 5, wherein for each syringe body the method
5 further comprises:

sterilizing the syringe body after said packaging step and prior to said unpackaging step.

7. A method as recited in Claim 5, further comprising;
10 interconnecting a flexible belt to said plurality of syringe bodies in a predetermined orientation prior to said packaging step.

8. A method as recited in Claim 7, wherein the holding, removing, filling and replacing steps are successively repeated in an automated manner for each of said
15 plurality of syringe bodies.

9. A method as recited in Claim 1, wherein for each syringe body the removing and replacing steps each include:
retainably engaging said cap in a retainer; and,
20 moving at least one of said retainer and said at least one holder in an automated manner to affect relative movement between the cap and the dispensing end of the syringe body.

10. A method as recited in Claim 9, wherein for each syringe body the
25 retainably engaging step comprises:
moving said holder along a predetermined path to insert the cap into the retainer.

11. A method as recited in Claim 9, wherein for each syringe body the filling step comprises:

interconnecting a fluid supply member with the dispensing end of the syringe body in an automated manner; and,

flowing fluid into the syringe body through the interconnected fluid supply member and dispensing end of the syringe body.

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12. A method as recited in Claim 11, wherein for each syringe body, said removing, filling and replacing steps are completed at a first location of the syringe body.

13. A method as recited in Claim 12, wherein for each syringe body, said
10 retainer and said fluid supply member are interconnected for tandem movement during said removing, filling and replacing steps.

14. A method as recited in Claim 11, wherein for each syringe body the method further comprises:

15 first locating the syringe body at a first location for completion of said removing step;

second locating the syringe body at a second location for completion of said filling step; and,

20 returning the syringe body to said first location for completion of said replacing step.

15. A method as recited in Claim 11, wherein for each syringe body the method further comprises:

sensing the position of a plunger end thereof to terminate said filling step.

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16. A method as recited in Claim 11, wherein said flowing step comprises at least one of the following:

injecting said fluid into the syringe body under pressure; and,

30 drawing said fluid into said syringe body by retraction of a plunger comprising the syringe body.

17. A method as recited in Claim 1, wherein for each syringe body the removing filling and replacing steps are completed in an automated manner.

18. An apparatus for filling a plurality of syringe bodies, comprising:
at least one holder for holding at least one syringe body in a predetermined orientation;

a retainer disposed for selectively removing and replacing a cap located at a dispensing end of a syringe body held by said at least one holder; and,

a fluid supply member disposed for selective fluid interconnection with and disconnection from a dispensing end of a syringe body held by said at least one holder.

19. An apparatus as recited in Claim 18, further comprising:
a driven support member for selectively moving at least one of said retainer and said fluid supply member towards and away from a dispensing end of a syringe body.

20. An apparatus as recited in Claim 19, wherein said driven support member is interconnected to both the retainer and fluid supply member for tandem embodiment according to one of a U-shaped motion pattern and a linear motion pattern.

21. An apparatus as recited in Claim 18, further comprising:
a driven support member for moving said at least one holder along a predetermined path.

22. An apparatus as recited in Claim 21, wherein said retainer and fluid supply members are located on a common side of said predetermined path.

23. An apparatus as recited in Claim 21, wherein said at least one holder is advanceable and retractable relative to said retainer.

24. An apparatus as recited in Claim 23, wherein said driven support member includes a rotatable drum, and wherein said at least one holder is located on said rotatable drum.

25. An apparatus as recited in Claim 24, wherein a plurality of holders are located on said rotatable drum.

26. An apparatus as recited in Claim 18, further comprising:
5 a first retention member for retaining a barrel of a syringe body; and
a second retention member for retaining a plunger of a syringe body, wherein said first and second retention members are disposed for driven relative movement therebetween.

10 27. An apparatus as recited in Claim 26, wherein said second retention member is disposed for driven retraction relative to said first retention member to draw fluid from said fluid supply member into a syringe body through dispensing end thereof.

28. An apparatus as recited in Claim 27, further comprising:
15 a sensor for sensing the position of a plunger within a barrel of a syringe body, wherein said sensor provides a sense signal for use in controlling said driven retraction of said second retention member.

29. An apparatus as recited in Claim 18, wherein said fluid supply member is
20 adapted to inject fluid under pressure into a dispensing end of a syringe body.

30. An apparatus as recited in Claim 29, wherein said retainer and fluid supply member are controllable for automated removal of a cap from a dispensing end of a syringe body, filling said syringe body with a fluid through said dispensing end, and
25 replacement of said cap on said dispensing end.